Psychiatric illness and mortality after hip fracture

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Summary

People with dementia or delirium have increased mortality in the 6 months after hip fracture, but depression might take longer to have an effect. We assessed the psychiatric status of 731 participants with hip fracture and analysed the effect of psychiatric illness on mortality during the next 2 years. We found that dementia, delirium, and depression all increased the risk of mortality ($p<0{\cdot}0001$, $p<0{\cdot}0001$, and $p=0{\cdot}0359$, respectively), and that mortality differed significantly between hospitals ($p=0{\cdot}0003$). We suggest that psychiatric interventions should be assessed in hip-fracture patients with adequate follow up of outcome measures.

Text

Hip fracture is a common cause of morbidity and mortality in older adults [1]. Psychiatric illness is thought to worsen prognosis of patients with hip fractures, although we questioned the evidence for this assertion in a recent systematic review [2]. We noted that small sample sizes had led to imprecise findings, dementia and delirium had not been distinguished, and that analysis was based on only one psychiatric diagnosis. We

have shown that survival at 6 months after hip fracture is adversely affected by dementia (hazard ratio 2·57 [95% CI 1·65–4·01]) and delirium (2·88 [1·76–4·72]), but not by depression (1·01 [0·53–1·94]) [3]. However, more than 6 months of follow up might be needed to detect the effect of depression [4]. We did a 2-year follow up of the cohort from our previous study to establish whether depression affects long-term survival after hip fracture.

All patients aged 65 years or older, admitted to two teaching hospitals (A and B) in the same city, and having hip-fracture operations during a 19-month period, were eligible for inclusion [3]. Neither hospital had a dedicated hip-fracture service; one hospital had weekly visits from a consultant geriatrician, whereas the other had no formal orthogeriatric collaboration. Psychiatric input in each hospital was by consultation. Psychiatric status was assessed by use of Geriatric Mental State/AGECAT software (community version 3a). Cognitive impairment was diagnosed with this software or by the standardised mini-mental state examination, and was classed as dementia, delirium, or both, with the delirium rating scale. If patients had depression and cognitive impairment, impairment was given diagnostic precedence. We recorded: age; sex; concurrent physical illness (by the Burvill scale); type of fracture; type of operation anaesthetic; hospital; and prefracture daily activities (using the Barthel score), socioeconomic status, accommodation, and support network.

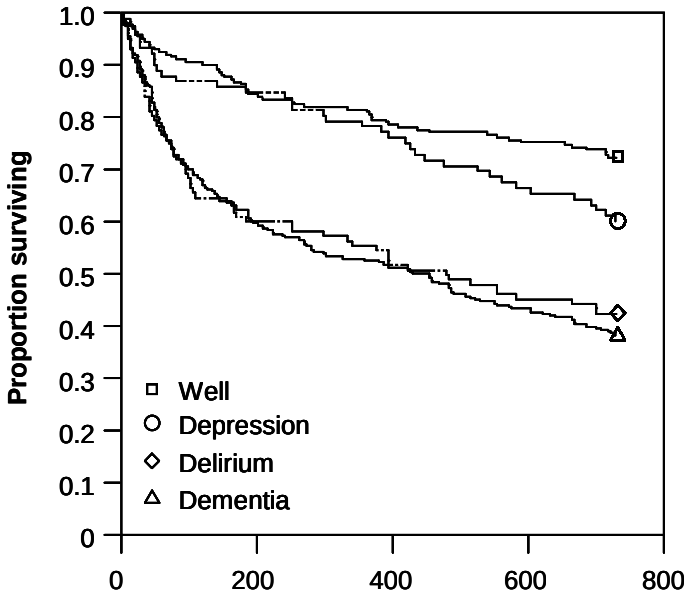
A researcher, unaware of the initial diagnosis, assessed survival at 2 years from time of admission by asking general practitioners and by searching a local health-service database. Data were analysed with a multivariate Cox's proportional hazards model by stepwise variable selection and analysis of interactions between variables; significant variables were retained ($p<0·05$). Assumption of constant proportionality over time of variables in the final model was validated. We obtained ethical approval.

903 patients met our inclusion criteria. Of these, 172 (19%) were excluded: 78 (9%) refused consent, 41 (5%) were too physically ill to be interviewed, 19 (2%) were too deaf to interview, 14 (2%) died before interview, ten (1%) did not have surgery, eight had dysphasia, one spoke no English, and one was transferred to another hospital.

Hence, our sample size was 731 patients. Of these patients: 208 (28%) were psychiatrically well, 294 (40%) had dementia, 108 (15%) had delirium, and 93 (13%) had depression. 66 patients with depression had not been prescribed antidepressants, which suggested that they either had newonset depression or had not previously been diagnosed. 28 people (4%) were diagnosed with other psychiatric disorders (alcohol misuse, schizophrenia, anxiety disorders, and phobias), which we did not include in our analysis.

Two years after admission 347 (47%) included patients had died, 384 (53%) remained alive, and none were lost to follow up. The Figure shows unadjusted survival of patients stratified by psychiatric diagnosis soon after hip fracture.

Figure. Kaplan-Meier curves of survival after hip fracture stratified by psychiatric diagnosis



Numbers at risk					
Well	208	172	161	153	148
Depression	93	79	71	62	56
Delirium	108	65	56	49	46
Dementia	294	176	151	128	113

Results of multivariate analysis of survival, adjusted for confounding factors, showed that diagnosis of depression, delirium, or dementia soon after hip fracture substantially

increased risk of death in the following 2 years (See Table). Risk of mortality was greater in one hospital than the other, even after controlling for confounding variables such as sociodemographic status.

Table: Multivariate survival analysis of hazard ratios for mortality 2 years after hip fracture in 731 elderly patients

Variable	Unit	Mortality		
		Hazard ratio	**p**	**95% CI**
Age	Years	1·024	.005	1·007 to 1·040
Sex vs. Female	Male	1·653	.0003	1·255 to 2·176
Admitting hospital vs. Hospital A	Hospital B	1·494	.0003	1·204 to 1·855
Activities of Daily Living	ADL Units	0·976	.0438	0·952 to 0.999
Physical illness vs. none	Overall		<.0001	
	Mild	1·377	.0541	0·994 to 1·906
	Moderate	2·000	<.0001	1·445 to 2·768
	Severe	2·928	<.0001	1·764 to 4·861
Psychiatric diagnosis vs. well	Overall		<.0001	
	Dementia	2·620	<.0001	1·883 to 3·645
	Delirium	2·404	<.0001	1·659 to 3·484
	Depression	1·566	.0359	1·030 to 2·381

Observational studies can be biased. Nevertheless, we have shown a substantial effect of psychiatric illness, especially dementia and delirium, on postoperative survival, which is unlikely to be totally attributable to confounding factors. Our findings have three implications. First, psychiatric illness is common in older people admitted to hospital with hip fracture, and its adverse effect justifies development of psychiatric or psychosocial interventions to complement physical rehabilitation in orthogeriatric care models. We found only one trial of a psychosocial intervention in geriatric people.

Participants in this trial were screened for psychiatric illness and, if such illness were found, were randomly assigned psychosocial assessment and care package, or treatment as usual.[5] Length of hospital stay and costs were reduced, but the intervention was not clearly described; hence general conclusions cannot be drawn. Second, prospective studies of depression in physical illness must be followed up for sufficient time, or important effects might be missed.[1] Third, differences in outcomes between hospitals might be caused by variations in the total package of care.[1] Thus, mortality rates after hip fracture were well chosen by the National Health Service executive as good clinical-performance indicators. Knowledge of variation in outcomes caused by service factors should aid evaluation, planning, and redesign of health-care services for older adults.

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